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Submitted to Astrophys. J. *Letters*
Fluorescent Excitation of Spectral Lines Chen and Pradhan
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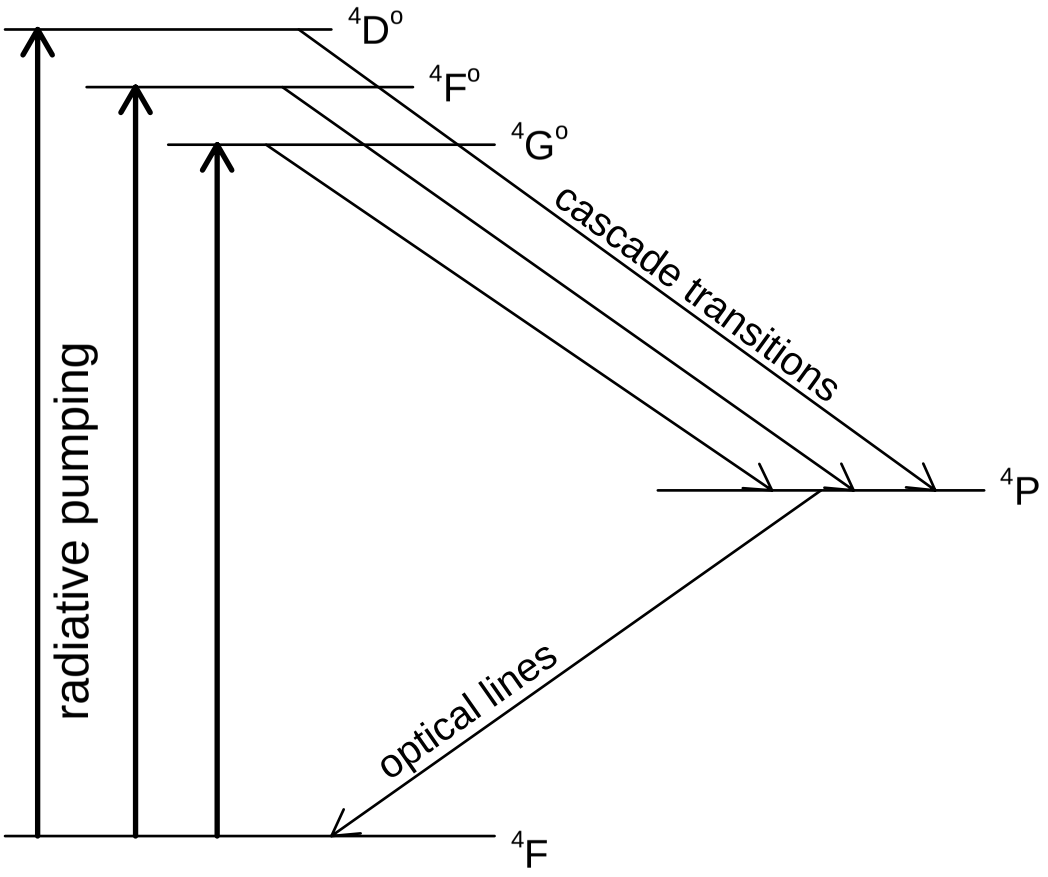
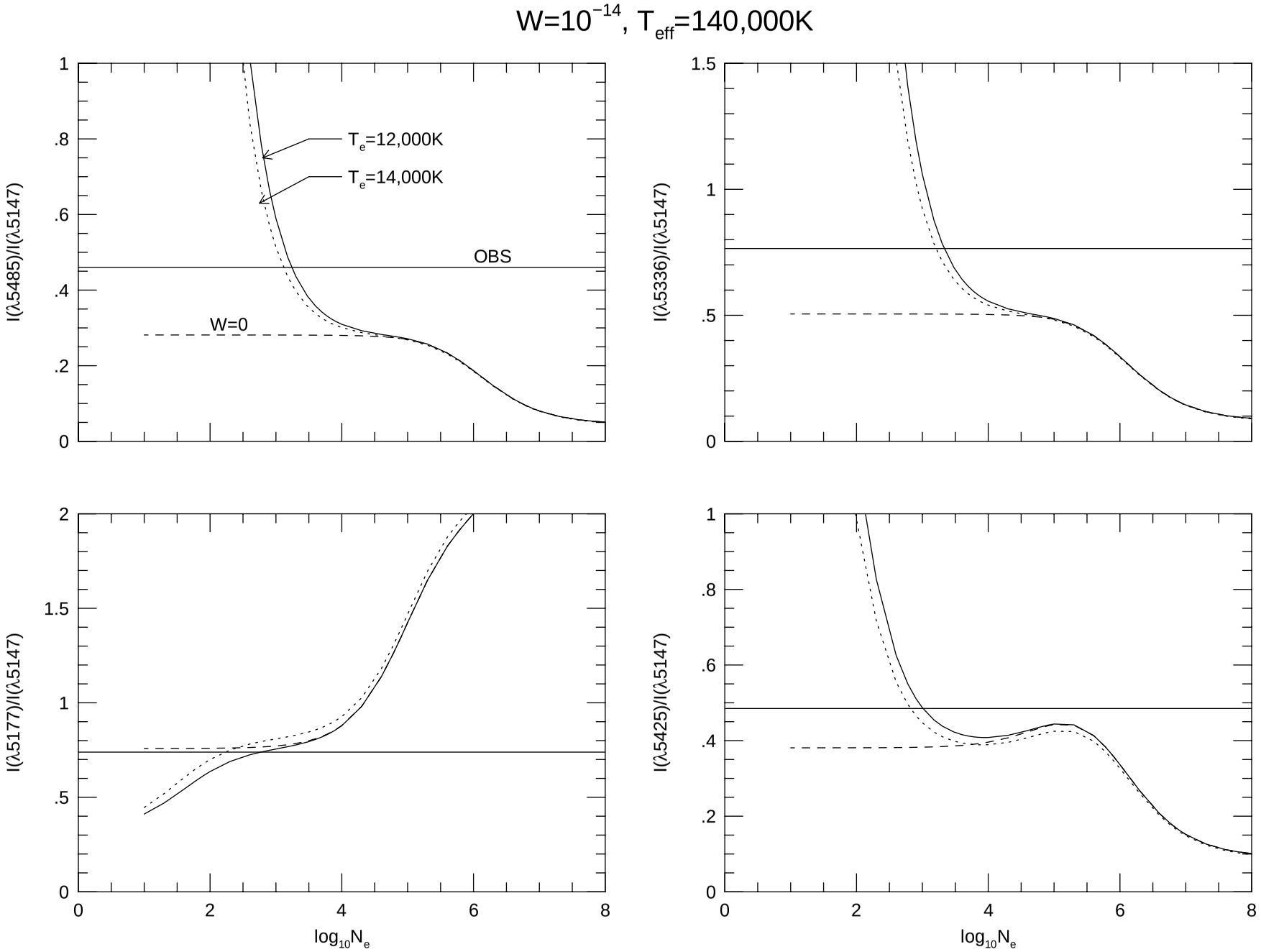
Fluorescent Excitation of Spectral Lines In Planetary Nebulae

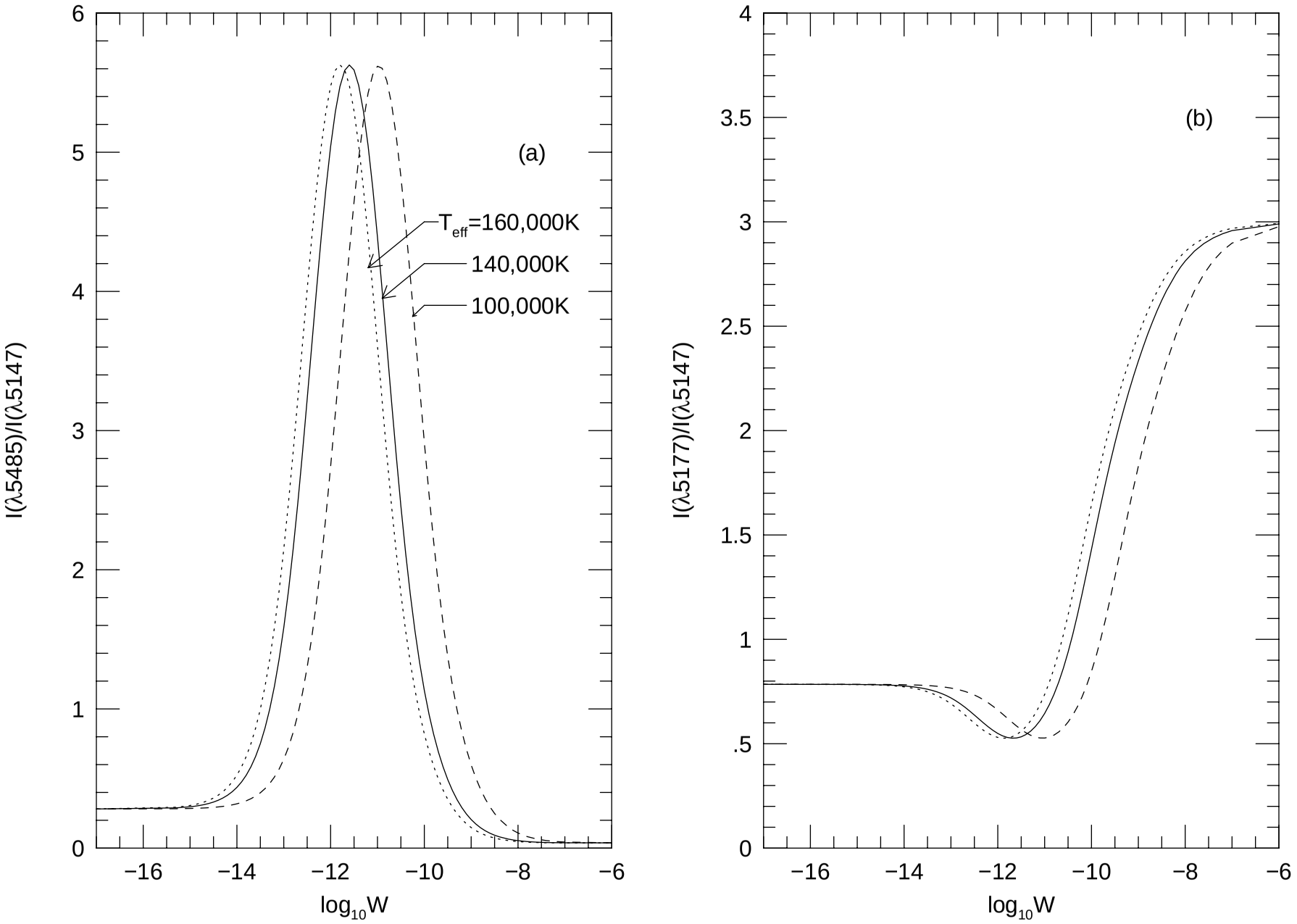
Guo Xin Chen and Anil K. Pradhan Department of Astronomy, The Ohio State University, Columbus, OH 43210

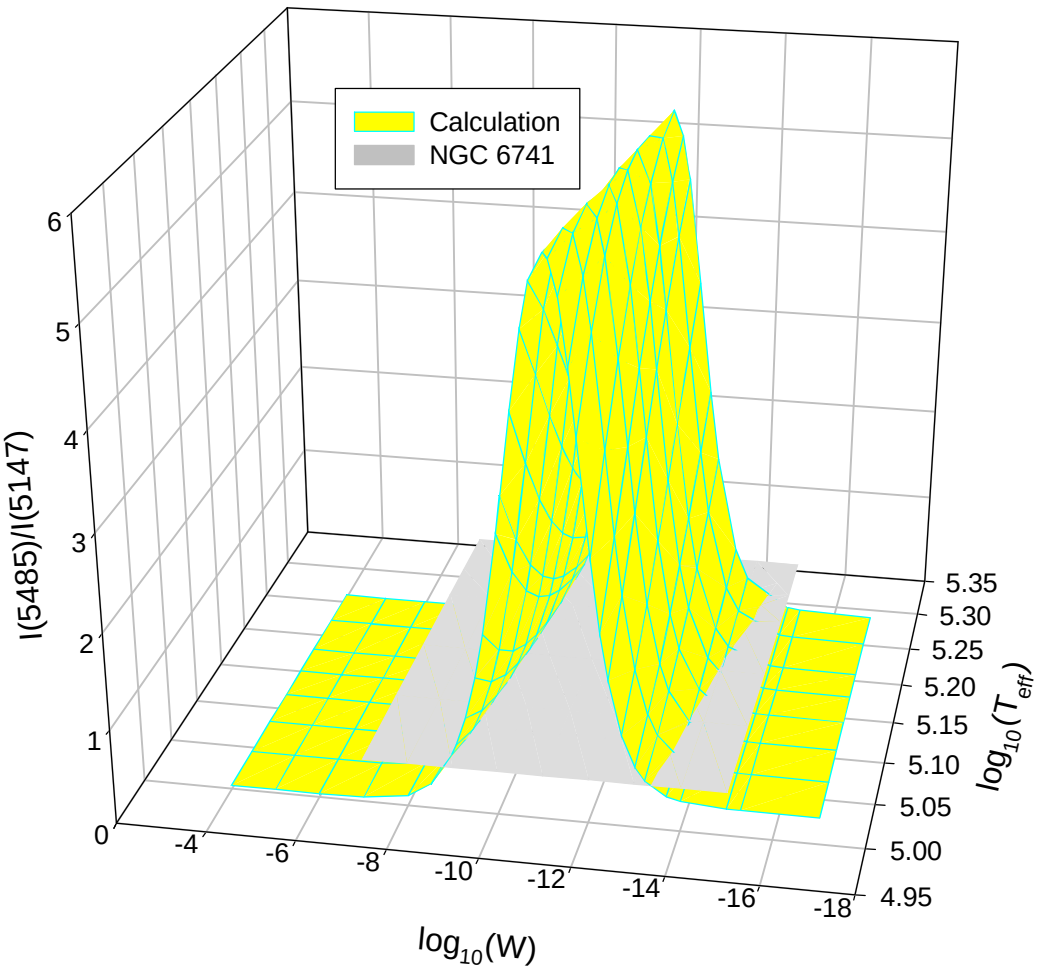
abstract Fluorescent excitation of spectral lines is demonstrated as a function of temperature-luminosity and the distance of the emitting region from the central stars of planetary nebulae. The electron densities and temperatures are determined, and the method is exemplified through a detailed analysis of spectral observations of a high excitation PN, NGC 6741, observed by hyu97. Fluorescence should also be important in the determination of element abundances. It is suggested that the method could be generally applied to determine or constrain the luminosity and the region of spectral emission in other intensively radiative sources such as novae, supernovae, and active galactic nuclei.

Fluorescent Excitation of Fe VI




W=10^-14, T_eff=140,000K
I(λ5485)/I(λ5147)
T_e=12,000K
T_e=14,000K
OBS
W=0
I(λ5336)/I(λ5147)
I(λ5177)/I(λ5147)
log10N_e
I(λ5425)/I(λ5147)
log10N_e


(a)
T_{eff}=160,000K
140,000K
100,000K
I(λ5485)/I(λ5147)
log$_{10}$W
(b)
I(λ5177)/I(λ5147)
log$_{10}$W


Calculation
NGC 6741
I(5485)/I(5147)
0
1
2
3
4
5
6
log10(W)
-4
-6
-8
-10
-12
-14
-16
-18
log10(Teff)
5.35
5.30
5.25
5.20
5.15
5.10
5.05
5.00
4.95